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NEW APHIDIDAE FROM CALIFORNIA¹

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It is the purpose of this paper to describe several new species of *Aphididae* taken during the past few years in California. Many of these species have been taken by the writer in his study of the plant lice during the past three years, while some others have been obtained from various people in different parts of the state. The species recorded here represent collections made in the vicinity of Sacramento; in the San Francisco Bay region, particularly in the vicinity of Stanford University and in Berkeley; and in Southern California, particularly in San Diego, Riverside, and Ventura Counties. Cotype specimens of all the species are in the writer's private collection in Riverside and in the collection of the University of California, Berkeley.

Myzocallis davidsoni new species (Figs. 1, 15, 34, 35, 36.)

In the fall of 1915 the writer found a large infestation of a species of *Myzocallis* on *Quercus pedunculata* in Berkeley. On examination this proved to be the same species which had been taken several times on various species of chestnuts (*Castanea* spp.) and considered as *Calaphis castaneae* (Fitch). It is a common species in the San Francisco Bay region, having been reported several times from Berkeley, Oakland, Stanford University

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and San José, as *Callipterus (Calaphis) castaneae* Fitch (Buckton).² However, it proves to be distinct from this species as brought out by a study of specimens together with Baker's paper on the genus *Calaphis*.³ The chief differences are the absence of antennal tubercles, thus placing the species in the genus *Myzocallis* rather than *Calaphis*, and the fact that the spur of the sixth antennal segment is scarcely twice as long as the base, while in *C. castaneae* (Fitch) the spur is practically four times as long as the base. There is little doubt but that the California species is distinct, so the author describes it herewith under the name of *Myzocallis davidsoni* new species, naming it after Mr. W. M. Davidson of the Bureau of Entomology. The alate stem mothers appear rather late in the spring, usually during the latter part of April or the first of May. These reproduce parthenogenetically throughout the summer, both alate and apterous viviparous females being produced. In the fall, usually during October and November, sexual forms appear, the males being alate and the oviparous females apterous. The sexupara are alate, at least in all collections seen by the writer in which there were sexual forms, only alate presexual forms were present. The writer has never observed the eggs, but they are laid during October and November on the bases of the buds, or on roughened parts of the bark of the branches, and even of the trunks of the trees. In September 1915, the writer found an infestation of this species on *Quercus pedunculata* in Berkeley, and in April 1916, Essig took it again from the same trees. Davidson⁴ described the alate male and the apterous oviparous females under the name *Calaphis castaneae* (Buckton), from specimens taken in San José in November. Following is a description of the alate and apterous viviparous females, taken from specimens collected by the writer

² Clarke, W. T., List of California Aphididae, Can. Ent., 35: 249, 1903, *Callipterus castaneae* Fitch, list; Davidson, W. M., Further Notes on the Aphididae Collected in the Vicinity of Stanford University, Jour. Econ. Ent., 3: 376, 1910, *Callipterus castaneae* Buckton, list; Davidson, W. M., Aphid Notes from California, Jour. Econ. Ent., 5: 405, 1912, *Calaphis castaneae* (Buckton), desc. sexes; Essig, E. O., Aphididae of Southern California, Pom. Jour. Ent., 4: 760, 1912.

³ Baker, A. C., A synopsis of the genus *Calaphis*, Proc. Ent. Soc. Washington, 18: 184-189, 1916.

⁴ Davidson, W. M., Aphid Notes from California, Jour. Econ. Ent., 5: 405, 1912.

in Berkeley from *Castanea* on July 31, 1915 (collection number AFS 61-15), and from *Quercus pedunculata* on September 26, 1915 (collection number AFS 74-15), and by Essig from *Castanea* in Berkeley on October 10, 1914 (collection number EOE 70). Cotype specimens are in the private collection of E. O. Essig, the private collection of the writer, and the collection of the University of California under the numbers listed above.

Alate viviparous female.—Prevailing color is lemon yellow. The head and prothorax have a black median longitudinal stripe and a similar one on each margin. The thoracic lobes are light brown, with the median part of each lobe slightly darker. The abdomen is lemon yellow with four rows of black spots, one row on each margin and two dorsal rows. These dorsal spots vary considerably in size, those on the fourth, fifth, and sixth segments being the largest, oftentimes being confluent, thus forming black transverse bands across these segments. The cornicles are dusky, the cauda and anal plate pale with the posterior margins darker. The legs are pale with the apical half dusky, and the tarsi and tips of the tibiae black. The antennae are grayish with the spur and tips of III-VI dusky.

The head (fig. 1) is almost triangular, being over twice as wide as long and coming to a distinct point at the apex between the cornicles. The antennal tubercles are lacking, or very small and indistinct. The antennae are about as long as the body, III being the longest segment, followed by IV, V, VI spur, VI base, I and II. The spur of VI is slightly more than half as long again as the base, together being longer than V, but shorter than IV. The usual primary and accessory sensoria are present on VI and the primary sensorium on V. On III there are from five to eight circular secondary sensoria, located in the basal two-thirds of the segment (fig. 15). The body is without lateral tubercles and without dorsal tubercles on the abdomen. The cornicles are almost cylindrical, being slightly broader at the base than at the apex (fig. 34). The cauda is knobbed (fig. 35) and set on a broad base; the anal plate is bilobed (fig. 36). The wing venation is normal. The costal vein is brown, the subcostal and stigma gray. The discoidals are brown and quite distinct, the first being slightly heavier than the others. The tips of the veins and the apex of the stigma are shaded with grayish-brown.

Measurements: Body length, 1.09-1.46 mm. (ave. 1.28 mm.); width of thorax, .468-.620 mm. (ave. .59 mm.); antennae total, 1.0965-1.751 mm. (ave. 1.4404 mm.); III, .357-.646 mm. (ave. .04977 mm.); IV, .238-.408 mm. (ave. .3231 mm.); V, .17-.281 mm. (ave. .2321 mm.); VI base, .068-.119 mm. (ave. .1038 mm.); VI spur, .1275-.0204 mm. (ave. .1816 mm.); cornicles, .08-.11 mm. (ave. .0974 mm.); cauda, .08-.09 mm. (ave. .086 mm.); hind tarsus, .12 mm.; wing length, 2.65 mm.; wing width, 1.01 mm.; wing expansion, 5.9 mm.

A very few of the alate females are without dorsal markings on the abdomen, but probably they are newly emerged adults, in which the colors have not as yet set.

Apterous viviparous female.—There is a considerable variety in the coloring of the apterous females. Some are pale lemon-yellow with pale brown spots on the abdomen and thorax to correspond with those of the alates. Some are pale lemon-yellow without dorsal markings, and others with slightly dusky markings here and there at the bases of some of the abdominal hairs. Others are of a pinkish color with the head and thorax pinkish-orange and the abdomen pinkish, with three small luteous spots caudad to a large median dorsal luteous spot. These three spots are located almost in a transverse line between the cornicles. The cornicles and cauda are pale. The legs are pale with the joints sometimes dusky. The antennae are luteous with the spur and the apices of segments III–VI dusky. The whole body is covered with fairly long capitate hairs, each arising from a more or less distinct tubercle, as is common in this genus.

Measurements: Body length, 2.18 mm.; width, .90 mm.; antennae total, 1.41 mm.; III, .39 mm.; IV, .31 mm.; V, .24 mm.; VI, base .14 mm.; VI, spur, .16 mm.

Myzocallis maureri new species (Figs. 2, 17, 29, 33, 39.)

In the summer of 1915, the writer took a few specimens of a species of *Myzocallis* from the under side of the leaves of coast live oak (*Quercus agrifolia*), on the campus of the University of California in Berkeley. He first found it on June 9, 1915, and then several times later, throughout June and July. George Shinji, a graduate student in the University, had already collected the same species in March. In April 1916, Essig sent the author a few specimens taken at that time in Berkeley. Only the alate viviparous females and the nymphs have been taken. In June 1916, the writer found it fairly abundant on the under side of the leaves of the California black oak (*Quercus kelloggii*), in the Cuyamaca Mountains of San Diego County, at an altitude of 3500 to 5000 feet. Here it was found only on the black oak, although in several cases a live oak (*Quercus agrifolia*) and a black oak were growing side by side, the former free from infestation, the latter more or less heavily infested. This latter observation is interesting, for in Berkeley the live oak was the only observed host plant. Specimens taken in Berkeley were examined by W. M. Davidson, J. J. Davis and E. O. Essig, but none were able to identify it with any species known to them. Consequently it is herewith described, being named *Myzocallis maureri*, after the writer's friend and classmate, Mr. L. M. Maurer of Los Angeles, California. Cotype specimens are in the author's collection under the serial number *AFS 53-15* and in the collection of the University of California.

Alate viviparous female.—Prevailing color light to apple green. Head, thorax, and abdomen light green. Eyes red. Prothorax apple green. Abdomen light green with margins and a small area about the base of each cornicle apple green. Beak light brown with tip dusky. Femora pale with apices dusky, tibiae dusky, tarsi and tips of tibiae black. Cornicles and cauda light green. Antennal joints I and II concolorous with head, III light brown with apical third darker, IV light brown with apical half darker, V and VI dark brown to black. Fore wings with costal and subcostal veins greenish gray, other veins light brown; costal cell hyaline; first discoidal vein broadly shaded with dark brown; second discoidal with base and tip shaded; tips of all other veins shaded, stigma hyaline with three borders (i. e., all except the outer) shaded with brown. Hind wings normal.

Antennal tubercles are small, slightly toothed on the inner side (fig. 2). First antennal segment slightly gibbous on inner side (fig. 2). Antennae considerably longer than the body, III being the longest segment, followed by IV, which is about three-fourths as long, which in turn is followed by V, being slightly more than one-half as long as III. The spur of VI is considerably longer than the base, the two being about as long as IV. On V and VI are the usual primary sensoria, and on VI the usual accessory sensoria. On III (fig. 17) there are from four to seven secondary sensoria (usually four), which are fairly large, circular and arranged in a single line along the basal one-third to one-half of the segment. The beak is short, scarcely reaching to the second coxae. Prothorax without lateral tubercles. The abdomen has about three fairly large lateral tubercles located usually on segments two, three, and four. In some specimens these are not discernible, while in others they are quite prominent. Cornicles (fig. 29) short, scarcely longer than broad at the base, and constricted in the middle. Cauda (fig. 33) slightly longer than cornicles, placed on a more or less narrow base, and with a knobbed tip. Anal plate (fig. 37) slightly more than half the length of the cauda, bilobed, the emargination being U-shaped.

Measurements: Body length, 1.445–2.125 mm. (ave. 1.955 mm.): width of thorax, .714–.85 mm. (ave. .765 mm.): antennae total, 2.363–2.703 mm. (ave. 2.473 mm.); III, .824–.969 mm. (ave. .862 mm.); IV, .459–.578 mm. (ave. .522 mm.); V, .374–.493 mm. (ave. .466 mm.); VI base, .17–.221 mm. (ave. .185 mm.); VI spur, .255–.34 mm. (.299 mm.): cornicles, .111–.17 mm. (ave. .129 mm.): cauda, .17 mm.: hind tarsus, .102–.136 mm. (ave. .119 mm.): wing length, 2.533–2.975 mm. (ave. 2.693 mm.): wing width, .799–1.105 mm. (ave. .977 mm.): wing expansion, 5.814–6.426 mm. (ave. 6.12 mm.).

Symydobius⁵ chrysolepis new species (Figs. 14, 16, 30, 32, 38.)

The hills in the vicinity of Alpine, San Diego County, are dotted here and there with maul oaks (*Quercus chrysolepis*), these being quite abundant in the little ravines. In April 1916, the writer noticed a number of ants crawling along a branch of one of these small oaks. This brought his attention to a colony of brownish colored, medium-sized aphids entirely encircling a terminal twig and leaf petiole. Further observation showed many of these colonies on many of the trees in the near vicinity. A considerable number of infested twigs were gathered and later examined in the laboratory. Only apterous viviparous females could be found then, but a few days afterward several alates appeared in the colonies in the laboratory. There were also a considerable number of Chalcid parasites,⁶ which had emerged from the apterae. Another examination of the trees near Alpine was made in July, but no aphids were found. Since then the writer has had no opportunity to make further observations. This species was at first thought to be *Symydobius albisiphus* Davis,⁷ but, after an examination of specimens sent him, Davis stated that although they were quite similar to specimens of *albisiphus*, he considered them as distinct. Below is a table of the major points of difference in the habits and structures of the two species:

<i>S. albisiphus</i> Davis	<i>S. chrysolepis</i> new species
Host: <i>Quercus alba</i> (a deciduous oak)	<i>Q. chrysolepis</i> (a live oak)
Occurrence: on under side of leaves near leaf petioles	on leaf petioles and twigs
Alates: Abdomen brown with a mid- dorsal whitish stripe	abdomen brown throughout
Body, length: ave. 1.16 mm.	ave. 1.49 mm.
Antennae, length: ave. .953 mm.	ave. 1.428 mm.
Sensoria: III, 7-8; IV, 0	III, 6-8; IV, 1-2

⁵ This species has been placed in the genus *Symydobius* Mordwilko only provisionally, as it is not typical of the genus. It is so closely related to *Symydobius albisiphus* Davis, however, that it has been thought best to include it in the same genus as Davis did his species. In the type species of *Symydobius* [*S. oblongus* (Heyden)] the anal plate is very indistinct or barely visible and the third antennal segment of the apterous female bears a few secondary sensoria. In this species (fig. 35) and in *S. albisiphus* Davis the anal plate is distinct and clearly bilobed, and the third antennal segment of the apterous female bears no sensoria. However, it more nearly fits *Symydobius* than any other genus known to the writer.

⁶ *Closterocerus utahensis* Crawford var. *californicus* Girault. The writer is indebted to A. B. Gahan and L. O. Howard for the identification of this and other hymenopterous parasites of the aphids listed in this paper.

⁷ Davis, J. J., New or little known species of Aphididae, Can. Ent. 46: 226-231, 1914. *Symydobius albisiphus* new species.

Apterae: antennal segments differ in coloration as follows:

<i>S. albisiphus</i> Davis	<i>S. chrysolepis</i> new species
IV, pale with tip dusky	pale with apical one-fourth dusky
V, pale with tip dusky	pale with apical one-half dusky
VI, pale with apical one-half dusky	dusky throughout

Neither Essig nor Davidson were able to identify this species with any known to them, and it is herewith described as a new species, being named after its only known host plant, *Quercus chrysolepis*. Cotype specimens are in the writer's collection under the serial number *AFS 6-16* and in the collection of the University of California.

Alate viviparous female.—Prevailing color dark brown. Head dark brown eyes red. Antennal segments I and II concolorous with the head, III pale with tip dusky, IV and V pale with apical one-third dusky, VI dusky throughout. Beak brown with apex darker. Prothorax and thorax dark brown with thoracic lobes very dark brown or black. Femora and tarsi of all the legs and tibiae of the hind legs dusky. Tibiae of the first two pair of legs pale with their apices dusky. Abdomen dark brown throughout. Cornicles pale, being whitish and very conspicuous in life. (This is the character which caused the writer to believe this species to be *S. albisiphus* Davis.) Cauda and anal plate pale at the base and dusky at distal edge. Wings normal.

Head about twice as broad as long with the front flat and with no antennal tubercles. Antennae (fig. 14) shorter than body, reaching only to the fifth abdominal segment. Segment III the longest segment, IV and V subequal and about three-fourths as long as III. Base of VI slightly longer than spur, the two together being but slightly more than one-half the length of III. The usual primary sensoria are present on V and VI, together with the usual accessory sensoria on VI. On IV there are one or two fairly large, circular, secondary sensoria, although in a few specimens there are no sensoria; one is located midway between the base and the apex of the segment (fig. 14), the second, when present, midway between the first and the apex of the segment (fig. 16). There are from six to ten fairly large, circular, secondary sensoria on III (figs. 14 and 16), extending from near the base almost to the apex. The beak does not quite extend to the second coxae. The prothorax and abdomen are without lateral tubercles. The cornicles (fig. 30) are short, being but slightly longer than broad at the base, and less than half as long as the hind tarsi, and are constricted in the middle. The cauda (fig. 32) is half-moon shaped, somewhat shorter than the cornicles. The anal plate (fig. 38) is distinct and conspicuously bilobed.

Measurements: Body length, 1.41-1.56 mm. (ave. 1.49 mm.); width of thorax .714-.765 mm. (ave. .733 mm.); antennae total, 1.38-1.52 mm. (ave. 1.428 mm.); III, .391-.434 mm. (ave. .416 mm.); IV, .264-.323 mm. (ave. .304 mm.); V, .272-.323 mm. (ave. .302 mm.); VI base, .128-.170 mm. (ave. .146 mm.); VI spur, .085-.128 mm. (ave. .101 mm.); cornicles, .051-.077 mm. (ave.

.063 mm.); hind tarsus, .136-.153 mm. (ave. .145 mm.); wing length, 2.44-2.55 mm. (ave. 2.5 mm.); wing width, .918-.986 mm. (ave. .95 mm.); wing expansion, 5.1-5.6 mm. (ave. 5.4 mm.). (This description was drawn from seven individuals reared from material collected on April 22, 1916.)

Apterous viviparous female.—Colored throughout as in the alate. Antennae are three-fourths as long as the body, III being the longest segment, followed by IV, which is about three-fourths as long. V is either equal to or slightly shorter than IV, the latter being the usual case. The base and spur of VI are subequal, and together about the same length as V, in some specimens being slightly longer and in some slightly shorter than V. The base of VI is usually a very little longer than the spur. The only sensoria are the primary ones on V and VI, and the accessory on VI.

Measurements: Body length, 1.68-1.97 mm. (ave. 1.841 mm.); width of abdomen, 1.24-1.45 mm. (ave. 1.354 mm.); antennae total, 1.26-1.38 mm. (ave. 1.304 mm.); III, .365-.390 mm. (ave. .381 mm.); IV, .289 mm.; V, .238-.276 mm. (ave. .2482 mm.); VI base, .136-.153 mm. (ave. .1416 mm.); VI spur, .085-.102 mm. (ave. .0961 mm.); cornicles, .042-.059 mm. (ave. .052 mm.); hind tarsus, .153 mm. (This description was drawn from twelve individuals collected on April 22, 1916.)

Nectarosiphon morrisoni new species (Figs. 4, 28, 31, 40, 41.)

In May 1915, Harold Compere of the California State Insectary collected a number of specimens of a species of a *Nectarosiphon* from the twigs of Monterey cypress (*Cupressus macrocarpa*), in Golden Gate Park, San Francisco. He found both the alate and apterous viviparous females. In August 1916, the writer found the apterae of the same species infesting the terminal leaves of both the Monterey cypress and the blue cypress (*Cupressus guadalupensis*), in Exposition Park, San Diego. This species was studied quite extensively by Morrison, who found it again in Golden Gate Park, but who was unable to identify it with any species known to him. Neither Essig nor Davidson knew it. Consequently it is herewith described as a new species, being named after Mr. Harold Morrison of the Federal Board of Horticulture, Washington, D. C., to whom the writer here wishes to acknowledge his great indebtedness for assistance and advice. Cotype specimens are in the writer's collection and in the collection of the University of California under the serial number *EOE 88*.

Alate viviparous female.—Prevailing color pea green to dark green. Head dusky, eyes red. Antennal segments I and II, and the base of III concolorous with the head, remainder black. Beak green with apex dusky. Thorax green, except the thoracic lobes which are dusky-amber to black. Abdomen pea

green throughout. Legs dusky except coxae and bases of femora, which are green. Cornicles dusky with the bases green. Cauda green, faintly dusky toward apex. Wings normal, veins being dusky-amber in color.

Head (fig. 4) almost rectangular in shape, the front being flat. Antennae are set on prominent tubercles, and are about twice as long as the body. Segment VI spur is the longest segment, followed by III, V, IV, VI base, I, and II. III is about four-fifths the length of VI spur, IV slightly shorter than V, which in turn is about five-sixths as long as III. VI base is about one-fifth as long as VI spur. In but one antenna of ten examined was V as long as III, and in but one was IV as long as V. The usual primary sensoria are present on V and VI, and the usual accessory sensoria on VI. IV is without sensoria. On III (fig. 4) there are from nine to eleven circular, equal-sized, secondary sensoria arranged in a more or less even line along the basal three-fourths of the segment. The beak is fairly long, reaching to the base of the abdomen. The prothorax and abdomen are without lateral tubercles. The cornicles (fig. 31) are large, vasiform, with the tip reticulated and the rest imbricated. They are about one-third the length of the body, usually being slightly longer than segment III of the antennae. The cauda (fig. 28) is about one-half the length of the cornicles, ensiform, and with upturned tip.

Measurements: Body length, exclusive of cauda, 1.34-1.72 mm.; width of thorax, .62-.70 mm.; antennae total, 2.69-2.91 mm. (ave. 2.807 mm.); III, .55-.62 mm. (ave. .594 mm.); IV, .31-.58 mm. (ave. .474 mm.); V, .31-.62 mm. (ave. .517 mm.); VI base, .16-.22 mm. (ave. .19 mm.); VI spur, .67-.795 mm. (ave. .745 mm.); cornicles, .61-.67 mm.; cauda, .23-.31 mm.; wing length, 3.48-3.74 mm.

Apterous viviparous female.—These are a light yellowish to a deep rich green color, with antennae, cornicles, and legs faintly dusky. The bases of the legs are light yellow to green; the cauda is light yellow, green, or faintly dusky. Segment III (fig. 40) of the antennae sometimes has one or two small sensoria near the base. Of eighteen segments examined, ten had no sensoria, seven had one, and one had two. The antennal tubercles, cauda, and cornicles are similar to those of the alates.

Measurements: Body length, exclusive of cauda, 1.61 mm.; width at base of cornicles, .75 mm.; antennae total, 2.65 mm.; III, .61 mm.; IV, .48 mm.; V, .45 mm.; VI, base .16 mm.; VI spur, .75 mm.; cornicles, .67 mm.; cauda, .22 mm.

Lachnus ferrisi new species (Figs. 3, 18, 19, 25.)

In 1909, and 1910 Davidson⁸ reported having found *Lachnus abietis* Fitch on *Abies concolor* (lowland fir) at Stanford University. In September 1915, G. F. Ferris found a large-sized species of *Lachnus* infesting the trunks of some young pine trees (*Pinus* sp.) at Stanford University. To the writer this species was

⁸Davidson, W. M., Notes on the Aphididae collected in the vicinity of Stanford University, Jour. Econ. Ent., 2: 299, 1909; and Further notes on the Aphididae collected in the vicinity of Stanford University, Jour. Econ. Ent., 3: 374, 1910.

entirely unknown, and specimens were sent to H. F. Wilson, E. O. Essig, and Harold Morrison. The first two were unacquainted with the species, and Morrison wrote as follows concerning it:

"As I suspected when I first saw your specimens, they are the same thing that Davidson called *Lachnus abietis* Fitch in his earlier papers. On comparing them with his specimens I can find only a few differences in the number of sensoria and in the relative lengths of segments IV and V of the antennae."

On the strength of this statement the writer lists *Lachnus abietis* Fitch of Davidson as a synonym of this species, which he describes herewith as *Lachnus ferrisi* new species, naming it after G. F. Ferris of Stanford University. Cotype specimens are in the writer's collection under the serial number AFS 72-15 and in the collection of the University of California.

Alate viviparous female.—Prevailing color dark brown to black, slightly pruinose. Head black or dark brown, eyes red. Antennal segments I and II dusky-yellow, III dusky with the base pale, IV dusky with the basal one-half pale, V pale with the tip dusky, VI dusky except a very small area near the base which is pale. Beak pale with the two apical segments dusky. Thorax dark brown, thoracic lobes black. Abdomen dusky amber to brown with two rows of marginal black spots. Cornicles black, cauda and anal plate concolorous with the abdomen, except the distal edges which are black. Coxae dark-brown, femora luteous at bases shading into black at apices, tibiae and tarsi black. In some cases there is a narrow amber-colored ring near the base of the tibiae. This may be present on any of the tibiae, particularly on the middle; it may be present on all of the tibiae; or it may be entirely absent. This is a character that is often met with in various species of *Lachnus*. Wings normal with the veins yellowish or brownish gray, stigma gray.

Head (fig. 3) about twice as broad as long, eyes very prominent, being placed on distinct tubercles. Antennal tubercles lacking. Antennae (fig. 18) reach to the base of the thorax, and are furnished with many fairly long, stiff hairs. III is the longest segment, followed in turn by V, IV, VI, I, and II. V is a little less than one-half as long as III, IV being but slightly shorter than V. In a few cases IV is longer than V. VI is about one-half as long as IV or V, the spur being but a short thumb-like process (fig. 18), as is typical of the *Lachnini*. On V and VI (fig. 18) there are the usual primary sensoria, and on VI the usual accessory sensoria. On segment V there are, in addition to the primary sensorium, one or two secondary sensoria located in the apical one-third of the segment, not far from the primary sensorium. Usually there is but one of these secondary sensoria. Of sixteen segments examined, fourteen had but one secondary sensorium, while two had two such sensoria. On segment IV (fig. 18) there are from three to six secondary sensoria, the modal number being four. Of seventeen segments examined, three had three

sensoria, eleven had four, two had five, and one had six. On segment III (fig. 18) there are from fifteen to twenty-one secondary sensoria extending from the apex to the base. Of eighteen segments examined five had fifteen sensoria, one had sixteen, nine had seventeen, one had eighteen, one had nineteen, and one had twenty-one. The modal number of sensoria on III is therefore seventeen. These secondary sensoria are quite large, circular, and located in an even line along the segments. The beak is fairly long, reaching usually to the middle of the abdomen, although in some cases it may reach to the base of the cauda or even slightly beyond the end of the body. The cornicles (fig. 25) are quite large for *Lachnus*, being of the typical cone-shaped form. The cauda is typical, being half-moon shaped and not separated from the abdomen. The first joint of the hind tarsus is about half as long as the second joint. This is an extremely large-sized species, being about four millimeters in length and two in width.

Measurements: Body length, 3.32–5.78 mm. (ave. 3.723 mm.); width of thorax, 1.33–1.67 mm. (ave. 1.492 mm.); antennae total, 2.67–3.21 mm. (ave. 2.937 mm.); III, 1.09–1.28 mm. (ave. 1.182 mm.); IV, .5–.56 mm. (ave. .519 mm.); V, .51–.64 mm. (ave. .569 mm.); VI, .23–.28 mm. (ave. .271 mm.); width of cornicles at base, .357–.425 mm. (ave. .3825 mm.); width at apex, .102 mm.; apparent height, .187–.225 mm. (ave. .221 mm.); first joint hind tarsus, .137–.19 mm. (ave. .1632 mm.); second joint, .289–.374 mm. (ave. .3502 mm.); wing length, 5.1–5.86 mm. (ave. 5.653 mm.); wing expansion, 12.24–13.175 mm. (ave. 12.708 mm.).

Apterous viviparous female.—These are brown mottled with black, and slightly pruinose. The antennae are dusky, except III, which is pale with the apex dusky, and the bases of IV and V, which are pale. On III there are seven or eight large, circular sensoria on the apical one-third (fig. 19), on IV there are four, on V two, and on VI one. The one on VI and the distal one on V are the usual primary sensoria, the others being secondary sensoria. The beak is similar to that of the alate reaching beyond the middle of the abdomen to about the base of the cauda or slightly farther. The thorax and abdomen are dark brown mottled with black. The coxae are black, as well as the tibiae, the tarsi, and the femora, except the basal one-third or one-fourth, which is amber colored. The cornicles are smaller than the alates, yet conspicuous, and are black. Measurements of one specimen are: body length, 4.75 mm.; width, 2.5 mm.; antennae total, 2.94 mm.; III, 1.14 mm.; IV, .54 mm.; V, .62 mm.; VI, .25 mm.

***Lachnus taxifolia* new species** (Figs. 10, 20, 26, 27.)

In August 1912, E. O. Essig collected a large number of specimens of a species of *Lachnus* on Douglass fir (*Pseudotsuga taxifolia*) in Capitol Park, Sacramento. George Shinji found the same species more or less abundantly on Douglass fir in Berkeley and in Golden Gate Park, San Francisco, throughout the spring and early summer of 1915. Specimens were sent to Davidson,

Davis and Wilson for determination. The first two reported that they were unacquainted with the species, while Wilson identified it as *L. pseudotsugae* Wilson, a species he had described from Douglass fir, in Oregon. After a careful study of a large series of specimens of this species, and a considerable number of cotype specimens of *Lachnus pseudotsugae* Wilson, the writer has come to the conclusion that they are distinct species, the California one being new and undescribed. Consequently it is herewith described as a new species, being named after its host plant, *Pseudotsuga taxifolia*. This aphid is of medium size, and is found on the older growths of the small limbs, and on the trunks of young trees, being a bark-feeder. Cotype specimens are in the writer's collection, and in the collections of E. O. Essig and of the University of California under the serial number EOE 36.

Alate viviparous females.—The body is covered with a slight pulverulence, causing it to appear quite pruinose. The ground color of the body is amber. Head dark amber, about the same width as the prothorax, or perhaps slightly narrower. Eyes black. Antennae (fig. 20) reach to the base of the abdomen, and are covered with stiff, bristle-like hairs, which arise from small but prominent tubercles. Segment I dark-amber, II dusky-yellow, III light-yellow with apex dusky, IV light-yellow with apical one-third dusky, V light-yellow with apical one-half dusky, VI dusky. The usual primary sensoria are present on V and VI, and the usual accessory sensoria on VI. Segment III has from three to seven rather large circular secondary sensoria in a more or less straight line, the first and the last slightly smaller than the others. There are one or two secondary sensoria at the apex of IV. The number of sensoria varies somewhat in the different individuals or in the two antennae of the same individual. Of twenty-two segments (III) examined three had three sensoria, four had four, eleven had five, six had six, and five had seven. Of twenty-two segments (IV) examined, nineteen had one sensorium, and three had two sensoria. Besides the primary sensorium on V, there may be one secondary sensorium, although this is not always so. The beak is dusky yellow with the apex darker, and reaches almost to the third coxae (1.1 mm. long). Prothorax with anterior half dark amber, posterior half black, about the same width as the head, or slightly wider, and with prominent lateral tubercles (.018 mm. long). Thoracic lobes black. Abdomen pruinose, the ground color being amber, with two rows of marginal black spots on each side. The cornicles (fig. 26) are short, being scarcely more than a black ring about .037 mm. in diameter. In many specimens the cornicles cannot be distinguished, but in either cleared material or specimens mounted on the side they are discernible. The cauda is well rounded, being half-moon shaped, with the distal margin dusky to black.

Anal plate with distal margin black. The body is practically bare except for bristle-like hairs on the antennae, legs, cauda, and anal plate. The coxae are black, the femora yellowish with tips dark, tibiae the same, tarsi dark. The first joint of the hind tarsus is about one-third the length of the second joint. The middle tibiae are about two-thirds as long as the hind tibiae. Wings (fig. 10) are hyaline with the costal, subcostal, and stigmal veins and the stigma grayish, and the first and second discoidal veins yellowish gray. The third discoidal is very indistinct and obsolete at the base. It is twice-branched, except in a few cases where it is but once-branched (in five out of thirty-one wings examined, it was once-branched). The first branch arises about halfway from the base to the wing margin, and the second from very near the margin to two-thirds the distance from the margin to the first branch, usually about one-half the distance. The angles of the branches are not particularly acute. Hind wings normal with yellowish gray veins.

Measurements: Body length, 2.08 mm.; width, 1.4 mm.; antennae, total, .634-.795 mm. (ave. .7672 mm.); III, .230-.305 mm. (ave. .2985 mm.); IV, .101-.137 mm. (ave. .118 mm.); V, .110-.146 mm. (ave. .1329 mm.); VI, .092-.126 mm. (ave. .1080 mm.); cornicles, diameter of opening, .037 mm.; first joint, hind tarsus, .073 mm.; second joint, .210 mm.; middle tibia, .99 mm.; hind tibia, 1.5 mm.; wing length, 5.3 mm.; width, 1.6 mm.

Apterous viviparous female.—The body coloring is about the same as that of the alate females. In some specimens the pulverulence is lacking, the individuals being a shiny-amber color. The antennae are colored as follows, I dark, II dusky yellow, III dusky yellow with tip dark, IV dusky yellow with apical one-half dark, V dark with base dusky yellow, VI dark. The usual primary and accessory sensoria are present, but there are no secondary sensoria. The beak is amber with base and tip dark, and reaches almost to the tip of the abdomen. The thorax is brown with black lateral longitudinal stripes. The abdomen is amber with black spots on the dorsum as in the alates, and with four black spots near the base of the cauda. The cornicles (fig. 27) are short and black, being slightly more distinct than in the alates. The coxae are black, femora amber with basal one-half dark, or amber throughout, tibiae amber with base and tip dark, tarsi dark.

Measurements: Body length, 2.00 mm.; antennae total, .715 mm.; III, .257 mm.; IV, .110 mm.; V, .119 mm.; VI, .110 mm.; cornicles, diameter of opening, .037 mm.; height, .010 mm.; first joint of hind tarsus, .073 mm.; second joint, .211 mm.

These specimens were carefully compared with cotype specimens of *Lachnus pseudotsugae* Wilson, in Essig's collection, and the following points of difference noted:

<i>L. pseudotsugae</i> Wilson	<i>L. taxifolia</i> new species
III with 3 to 4 secondary sensoria	III with 3 to 7 sensoria (modal number being 5)
III almost as long as IV, V, and VI together	III scarcely as long as IV and V

<i>L. pseudotsugae</i> Wilson	<i>L. taxifolia</i> new species
Beak reaching distinctly beyond third coxae	Beak reaching scarcely to third coxae
Cornicles normal, being quite conspicuous	Cornicles scarcely discernible
First joint of hind tarsus not quite one-third the length of the second	First joint of hind tarsus equal to or longer than one-third the length of the second
Angles of branches of the third discoidal very acute	Angles of branches of third discoidal not particularly acute.

The difference in the relative lengths of the third antennal segment, the great difference in the cornicles, and the difference in the lengths of the beaks are sufficient characters in the writer's opinion to warrant a separation of species.

Aphis ramona new species (Figs. 5, 11, 22, 23.)

There came to the writer's hands several specimens of a species of *Aphis* taken by E. O. Essig and S. H. Essig, county horticultural inspector of Ventura County, on black sage (*Ramona stachyoides*, at Nordhoff, Ventura County, August 1911, and at Santa Paula, April 1913. Concerning its habits Essig merely notes, "Attacks black sage, more or less heavily parasitized, attended by ants to a large extent." The species does not agree with any known to the writer, nor to Essig or Davis, both of whom examined specimens, consequently it is herewith described as a new species, being named *Aphis ramona*, after the generic name of its only recorded host plant. Cotype specimens are in the private collection of E. O. Essig, in the private collection of the writer, and in the collection of the University of California under the serial number *EOE 12*. The color notes in the following description are taken from those of E. O. Essig.

Alate viviparous female.—Prevailing color green and dark-brown, the head being dark-brown, with a distinct tubercle at the apex of the front and small but distinct antennal tubercles (fig. 5). The eyes are red. The antennae (fig. 11) are dusky brown throughout, except the tip of V and all of VI, which are slightly paler. Segment III is the longest segment, the spur of VI next, followed by IV and V which are subequal, but slightly shorter than the spur of VI and about one-third the length of III. I and II are subequal and about two-thirds the length of the base of VI. The usual primary sensoria are present on V and VI and the accessory on VI. Segment IV has from one to four fairly large, circular, secondary sensoria, placed in a more or less even row along the

distal half. Of twenty segments examined, two had one sensorium, eight had two sensoria, seven had three, and three had four sensoria. On segment III there are from ten to seventeen secondary sensoria scattered irregularly along the entire length of the segment. Of twenty segments examined, two had ten sensoria, three had eleven, five had twelve, three had thirteen, three had fourteen, one had fifteen, two had sixteen, and one had seventeen. The thorax is brown, with the lobes almost black. A pair of small but distinct lateral tubercles is present on the prothorax. The abdomen is green, with dark markings in the form of cross bands and spots on the dorsum. Lateral tubercles are present on the first and seventh segments. The cornicles (fig. 22) are brown, distinctly imbricated, almost cylindrical, and about equal in length to segments IV or V of the antennae, being considerably shorter than III. The cauda (fig. 23) is cusiform, light brown, with the distal end slightly darker, a little more than half the length of the cornicles and about the same length as the hind tarsi, or perhaps slightly longer. The legs are pale, with the coxae, tarsi, apical two-thirds of the femora, and apices of the tibiae dusky. The wings are normal, hyaline, stigma light brown or amber, veins brown.

Measurements: Body length, .98 mm.; width of thorax, .48 mm.; antennae total, .81 mm.; III, .20-.23 mm.; IV, .14 mm.; V, .12-.14 mm.; VI base, .08 mm.; VI spur, .15 mm.; cornicles, .14 mm.; cauda, .08 mm.; hind tarsus, .08 mm.; wing length, 2.07-2.11 mm.; wing width, .780-.810 mm.

Apterous viviparous female. Prevailing color a rich dark green with head dusky brown. Eyes are red. Antennae are dusky brown throughout, reaching to the base of the cornicles, with only the usual primary and accessory sensoria present. Segment III is the longest segment, with IV, V, and the spur of VI following, all of which are subequal, or in some cases with IV slightly the longest, V being next. I and II are subequal and slightly shorter than the base of VI. Very small but fairly distinct antennal tubercles are present. The beak is light green, with the tip dusky, and reaching to the middle of the third coxae. The thorax and abdomen are rich green without dorsal markings. Lateral tubercles are present on the prothorax and on the first, second, and seventh abdominal segments. The cornicles are concolorous with the abdomen, or very slightly darker, with the tip dusky, tapering slightly from base to apex and about as long as segment III of the antennae. The cauda is about one-half the length of the cornicles, being about one-half as long again as the hind tarsi, ensiform, concolorous with the abdomen, or with the distal end slightly dusky. The anal plate is dusky and half-moon shaped. The legs are pale with the coxae, tarsi, and tips of the tibiae dusky.

Measurements: Body length, 1.14 mm.; width of thorax, .67 mm.; antennae total, .95 mm.; III, .25-.26 mm.; IV, .17-.19 mm.; V, .16 mm.; VI base, .09 mm.; VI spur, .14 mm.; cornicles, .25 mm.; cauda, .12 mm.

Aphis senecio new species (Figs. 6, 12, 21, 24.)

This is a very common species throughout central and southern California, and has been reported several times as *Aphis bakeri* Cowen.⁹ Davidson's description of *Aphis* sp. (1909) probably is also of this species. Concerning this Davidson writes: "I think the species on *Senecio mikanoides* was the same as on the other plants, but there might have been more than one species on the host." Although this species was considered for a long time to be *Aphis bakeri* Cowen, the fact that it was never found on apple or other deciduous trees where *A. bakeri* is supposed to pass the winter, as well as the fact that it never seemed to have any particular liking for clover, on which *A. bakeri* is described as being a considerable pest, led the writer to believe that it was not this species, but some other. Davidson writes that he has noticed this and is of the same opinion. Morrison was also doubtful, although neither he nor Davis were able to detect any structural differences. Gillette stated that he has specimens from Davidson, and that he does not consider it to be *Aphis bakeri* Cowen, as it differs particularly in habits, and structurally in the length of the beak. Below is an extract from a letter from Davidson concerning this species.

"Williams' *Aphis senecioms* appears to be closely related but is obviously different in the sensoriation and other points. None of Williams' other Compositae species appear to approach this species. The first host upon which I took it was the common groundsel, which, I believe, is an imported European species. This might point to its occurrence in Europe, but I am unable to fit it to any European species. I think you are justified in giving it a name, as no American aphidologist has been able to determine it for surety."

The species has been taken throughout the San Francisco Bay region and throughout southern California on a large number of host plants, particularly *Compositae*. At present there are about twenty-two host plants, belonging to sixteen genera

⁹Davidson, W. M., Notes on the Aphididae Collected in the Vicinity of Stanford University, Jour. Econ. Ent., 2: 302, 1909, *Aphis* sp., desc.; Davidson, W. M., Further Notes on the Aphididae Collected in the Vicinity of Stanford University, Jour. Econ. Ent., 3: 377, 1910, *A. bakeri* Cowen (?), list; Davidson, W. M., Plant Louse Notes from California, Jour. Econ. Ent., 7: 133, 1914, *A. bakeri* Cowen, list; Essig, E. O., Insects of California, Cal. Com. Hort., 87, 1915, *A. bakeri* Cowen, list.

and six families. According to Davidson "on German ivy it seems to exist the year around, the annuals being infested by migrants from it." The writer has noticed this in the San Francisco Bay region, but in Southern California it is found during the winter, particularly on asters and marigolds. When the hot weather of the summer in the south begins, it seems to disappear, not being found again until fall. In the early part of the year (January and February) the alates are most common, the apterae appearing later. Following is a list of the host plants and collection records:

FOOD PLANTS

Salicaceae. Willow family.

Salix sp. (willow). Berkeley, Essig, 1915.

Polygonaceae. Buckwheat family.

Rumex sp. (dock). Stanford University, March, 1915, apterae.¹⁰

Leguminaceae. Pea family.

Cytisus proliferus (broom). Berkeley, Essig, 1915.

Malvaceae. Mallow family.

Abutilon sp. (Indian mallow). Stanford University, February, 1915, apterae.

Boraginaceae. Borage family.

Ambrosia psilostachya (western ragweed). Berkeley, Essig, 1915.

Amsinckia sp. Stanford University, Davidson, 1909.

Amsinckia intermedia (buckthorn weed). Stanford University, Morrison, 1912.

Amsinckia spectabilis. Berkeley, Essig, 1915.

Compositae. Composite family.

Anthemis sp. (chamomile). San Francisco Bay region, Davidson, 1914.

Artemesia sp. (sagebrush). San Francisco Bay region, Davidson, 1914.

Artemesia californica (old man). Berkeley, Essig, 1915.

Artemesia heterophylla (California mugwort). Berkeley, Essig, 1915.

Aster, cultivated. San Diego, January, 1916, alate; Ontario, San Bernardino County, January, 1917, alate.

Baccharis pilularis (chapparal broom). Berkeley, Essig, 1915; Stanford University, Ferris, 1916.

Calendula officinalis (marigold). Berkeley, Essig, 1915; San Diego, March, 1916, apterae; Riverside, February, 1917, alate; Orange, Orange County, February, 1917, alate and apterae.

¹⁰ In references where no collector's name is given the collection was made by the writer.

- Chrysanthemum* cultivated. Berkeley, Essig, 1914; Menlo Park, San Mateo County, March, 1915, apterae; Berkeley, October, 1915, alate and apterae; San Diego, January, 1916, alate; La Jolla, San Diego County, February, 1916, apterae; Ontario, San Bernardino County, January, 1917, apterae.
- Gnapholium* sp. (everlasting). Walnut Creek, Contra Costa County, Davidson, 1914.
- Grindelia cuneifolia* (marsh grindelia). Walnut Creek, Contra Costa County, Davidson, 1915.
- Helianthus* sp. (sunflower). San Francisco Bay region, Davidson, 1914.
- Senecio* sp. (German ivy). Stanford University, Davidson, 1909; *ibid*, 1914; Palo Alto, Santa Clara County, February 1915, apterae.
- Senecio mikanoides* (ivy senecio). Stanford University, Davidson, 1909 (?); Berkeley, Essig, 1915.
- Senecio vulgaris* (common groundsel). Stanford University, Davidson, 1910; Santa Paula, Essig, 1911.

Following is a description of this species under the name of *Aphis senecio* new species. Cotype specimens are in the writer's collection and in the collections of E. O. Essig and the University of California.

Alate viviparous female.—The prevailing color is pale green with the head, thoracic lobes, and markings on the dorsum of the abdomen olive green to black. The head (fig. 6) is olive green to black, almost triangular with a distinct tubercle at the apex of the frons. Antennal tubercles are absent. Eyes are red. The antennal formula is as follows: III, VI spur, IV, V, VI base, I, and II. Segments V and VI have the usual primary and accessory sensoria. On III there are fairly large, circular secondary sensoria, arranged irregularly along the whole length of the segment, and in such numbers as to cause the segment to appear tuberculate (fig. 12). Four specimens from *Chrysanthemum* (Berkeley, October 1915) had the following number of sensoria: 20, 23, 24, 24, 25, 25, 26, 27. Three specimens from *Senecio* (Essig, Berkeley, 1915) had 20, 22, 22, 22, 22, 23. Five specimens from *Amsinckia* (Morrison, Stanford University, 1912) had 19, 21, 21, 21, 22, 22, 22, 23, 23, 24. Two specimens from *Baccharis* (Stanford University, Ferris, 1916) had 21, 21, 23, 24. The modal number of sensoria appears to be 22 or 23. The secondary sensoria on IV are of various sizes, ranging from very small to almost as large as those on III. They are arranged in a more or less even row, and quite irregularly. Of twenty-five segments examined (the same specimens as above for III) two had one sensorium, two had two sensoria, nine had three, five had four, two had five, four had six, and one had seven sensoria. The modal number appears to be three or four. The thorax is dull green with the lobes very dark olive brown or black. Small lateral tubercles are present on the prothorax. The beak is pale at the base and dark green at the apex, and reaches distinctly beyond the second coxae, in fact almost to the third coxae. In some cases it even reaches to the middle of the third coxae. In this character

is found the chief structural difference between this species and *Aphis bakeri* Cowen, for in the latter the beak "barely reaches to the second coxae." The writer has just recently had opportunity to examine specimens of *Aphis bakeri* Cowen, from clover and apple in Utah, taken by R. W. Doane during the summer of 1916, and has noted the quite striking difference between the beaks of this and *Aphis senecio* new species. The abdomen is dull pale green with dorsal black markings in the form of blotches or spots. The cornicles (fig. 21) are short and dark, and tapering slightly, but with the apex somewhat flanged. The cauda (fig. 24) is short with the distal end dusky, about the same length as the cornicles. The cornicles, cauda, and hind tarsi are subequal in length. The coxae are black, the femora black or dusky with the basal one-fourth to one-third pale, the tibiae greenish with the apical one-fifth to one-fourth black or dusky, the tarsi are black. The wings are of normal size and venation, being hyaline. The veins are light brown, the stigma grayish brown.

Measurements: Body length, 1.17–1.25 mm.; width of thorax, .47–.48 mm.; antennae total, 1.09–1.34 mm.; III, .31–.39 mm.; IV, .19–.23 mm.; V, .13–.16 mm.; VI base, .08–.11 mm.; VI, spur, .23–.36 mm.; cornicles, .09–.11 mm.; cauda, .08–.09 mm.; hind tarsus, .09–.11 mm.; wing length, 2.2–2.7 mm.; wing width, .87 mm. The spur of segment VI is slightly shorter than III in most cases, although in some it is equal to III, but never longer.

Apterous viviparous female.—Prevailing color pale green with head, prothorax, antennae, legs, and cornicles almost luteous. The tip of segments V and all of VI are dusky. The cauda is pale green. The cornicles and cauda are of the same shape as those of the alates. The beak is similar to that of the alates, being pale with the apex dusky, and reaching distinctly beyond the second coxae and even to the middle of the third coxae. The usual primary and accessory sensoria are present on V and VI, but no secondary sensoria are found.

Measurements: Body length, 2.21 mm.; width of thorax, 1.07 mm.; antennae total, 1 mm.; III, .24 mm.; IV, .17 mm.; V, .11 mm.; VI, base, .11 mm.; VI spur, .22 mm.; cornicles, .11 mm.; cauda, .08 mm.; hind tarsus, .09 mm.

Cerosipha¹¹ cupressi new species (Figs. 7, 8, 9, 13, 39.)

In April 1916, the writer observed a few specimens of a very small green aphid on the terminal twigs of blue eypress (*Cupressus guadelupensis*) in Exposition Park, San Diego. Only the small apterous females could be found. These were very remarkable because of their very convex abdomen, conspicuous

¹¹This species does not fit exactly into either *Sipha* or *Cerosipha*, on account of the atrophied cornicles. The description of *Cerosipha* is very brief and may be extended to include a species with such atrophied cornicles. Following is a copy of Del Guercio's original description of the genus, which was published in 1909 (?) in NOUVE RELAZIONI R. STAZIONE ENTOM. AGRARIA,

cauda, and atrophied cornicles. Again in August 1916, the author took a number of specimens of the species from *Cupressus guadelupensis* and *C. macrocarpa* (Monterey cypress) in San Diego. A few alate females were reared in the laboratory. On the Monterey cypress this species was accompanied by specimens of *Nectarosiphon morrisoni* new species (see above). In January 1917, it was again observed on blue cypress, this time in White Park, Riverside. The writer kept this infestation under observation for several months. It was noted that the apterae were found singly at the base of the terminal leaves. The alates were very scarce and were obtained only by placing infested branches in closed receptacles. This leads to the view that they undoubtedly migrate to some other host. A large percentage, probably as high as forty per cent, of the apterae were parasitized by a small *Braconid*¹² fly. Other species of *Cupressus* have been carefully examined by the writer, but, with the exception of these two, he has not found any infested with this little aphid, nor has he ever seen any aphid similar to it on another kind of plant.

FIRENZE—Serie Prima—No. 2, page 116. This reference and description was obtained through the kindness of H. F. Wilson of the University of Wisconsin.

“Gen. XXV. *CEROSIPHA*, Del Guercio.

“Antennae breves quinquearticulate, articuli quinti processus terminalis setaceus tertium subequans. Nectaria cylindrica.

“SYNOPSIS SPECIERUM.

“Species unica.

1. *Cerosipha Passeriniana*.

“REVISIO SPECIERUM.

“1. *Cerosipha Passeriniana*, Del. G.

“La specie prende nome de quello del Sig. Conte Prof. H. Passerini, di Firenze, che me l'ha gentilmente comunicata. Si trova con le femmine attere nella pagina inferiore delle foglie della *Salvia splendens*, di primavera, Perugia, Maggio 1899.”

The writer is unacquainted with the type species, as well as with the one previously known American species of this genus, *Cerosipha rubifolii* Thomas, but believes that the species here in question fits this genus nearer than it does *Sipha*, particularly in the relative lengths of the third antennal segment and the spur of the sixth. This species is very odd, however, and could well be placed in a separate genus.

¹²This was determined by A. B. Gahan to be an undescribed species of *Trioxys*.

It is described herewith as a new species, naming it after its host plant, *Cupressus* spp. Cotype specimens are in the writer's private collection under the serial numbers *AFS* 36-16 and *AFS* 2-17 and in the collection of the University of California under the serial number *AFS* 2-17.

Alate viviparous female.—Prevailing color dark green and black. Head and thorax very dark green to black. Antennal segments I and II concolorous with the head, III green with dusky apex, IV, V, and spur dusky. Beak green with apex dusky. Wings normal with grayish veins and grayish-green stigma. The coxae are dusky, femora green with the apical one-half of the hind pair in some specimens darker green, and in other specimens with all three pairs green with apices only darker, tibiae green with apices dusky, tarsi dusky. Cauda and anal plates dark green.

Head (fig. 8) rectangular, front flat, no antennal tubercles. Antennae (fig. 13) short, scarcely reaching to the base of the abdomen, five-segmented. Segment III and V are subequal, or III slightly longer. This character takes this species out of the genus *Sipha*, and places it more nearly into *Cerosipha* in which III and V are subequal (see note 11, pages 19 and 20). In two antennae examined V was slightly longer than III, but in all other cases III was either equal to or slightly longer than V. The base and spur of V are subequal, or the spur a little longer. Segment IV is equal to or somewhat longer than the base of V. On V are present the usual primary sensorium and the small accessory sensoria. On IV there is always one sensorium at the apex (primary sensorium?) and from one to three secondary sensoria located in the apical one-half. Usually there is but one which is located about the middle of the segment. On III there are from five to eight (usually six) fairly large, circular, secondary sensoria, arranged in an even line from base to apex. From the sensoriation it would appear that segments IV and V correspond to V and VI of the typical Aphidid antennae, while III corresponds to III and IV. The beak is short, reaching only to the second coxae. The prothorax and abdomen are without lateral tubercles, in so far as could be determined from the specimens on hand. The wings (fig. 9) are normal, with normal Aphidine venation. The second branch of the third discoidal is nearer to the tip of the wing than to the base of the first branch, somewhat as in *Aphis avenae* Fabr. and *Aphis salicicola* Thomas, although perhaps not quite so marked. The cauda (fig. 39) is long, ensiform, and quite conspicuous, being slightly more than one-eighth the length of the body, and one-half as long again as the hind tarsi. The cornicles are atrophied, being merely pores, and very hard to distinguish. In most of the writer's material it is impossible to see them, but in a few specimens, mounted on the side and cleared considerably, the pores can be made out.

Measurements: Body length, .986-1.275 mm. (ave. 1.122 mm.); width of thorax, .561-.629 mm. (ave. .578 mm.); antennae total, .493-.616 mm. (ave. .583 mm.); III, .153-.238 mm. (ave. .204 mm.); IV, .085-.127 mm. (ave. .109 mm.); V, .187-.204 mm. (ave. .197 mm.); cauda, .144-.170 mm. (ave. .158 mm.);

hind tarsi, .102-.119 mm. (ave. .115 mm.) wing length, 1.7-1.82 mm. (ave. 1.761 mm.); wing width, .561-.765 mm. (ave. .694 mm.); wing expansion, 3.70-4.23 mm. (ave. 4.05 mm.).

Apterous viviparous female.—Prevailing color pale yellowish-green, shiny. Eyes black. Antennae, beak except apex, and legs except tarsi, tips of tibiae, and distal one-half of hind femora, pale. Cauda, apex of beak, tarsi, tips of tibiae and femora, and apical one-half of hind femora dusky. Abdomen very convex (fig. 7), in life being as high as it is wide. Cauda not visible from above in living specimens, although in mounted material it is very conspicuous. Antennae are short, reaching only to the mesathorax, beak barely reaching second coxae. Abdomen without lateral tubercles in so far as can be discerned. Cornicles merely pores. The great convexity of the abdomen (fig. 7) is a distinguishing character.

Measurements: Body length, 1.15-1.29 mm. (ave. 1.244 mm.); width of abdomen (mounted), .85-1 mm. (ave. .92 mm.); height of abdomen (mounted), .85-1.03 mm. (ave. .91 mm.); antennae total, .51-.54 mm. (ave. .52 mm.); III, .136-.170 mm. (ave. .15 mm.); IV, .093-.102 mm. (ave. .097 mm.); V, .17-.204 mm. (ave. .19 mm.); cauda, .187-.204 mm. (ave. .195 mm.); hind tarsi, .119 mm.; diameter of cornicle at base, .035 mm.; diameter of opening, .021 mm.

FIGURES

All drawings made with the camera lucida, and on the same scale, except numbers 7, 9, and 10, which are drawn with a smaller magnification. The 25 mm. ocular and 16 mm. objective used throughout.

- Fig. 1.—*Myzocallis davidsoni* new species. Head, alate.
 Fig. 2.—*Myzocallis maureri* new species. Head, alate.
 Fig. 3.—*Lachnus ferrisi* new species. Head, alate.
 Fig. 4.—*Nectarosiphon morrisoni* new species. Head, alate.
 Fig. 5.—*Aphis ramona* new species. Head, alate.
 Fig. 6.—*Aphis senecio* new species. Head, alate.
 Fig. 7.—*Cerosipha cupressi* new species. Apteran—side view.
 Fig. 8.—*Cerosipha cupressi* new species. Head, alate.
 Fig. 9.—*Cerosipha cupressi* new species. Distal portion of wing.
 Fig. 10.—*Lachnus taxifolia* new species. Distal portion of wing.
 Fig. 11.—*Aphis ramona* new species. Antennal segments III and IV, alate.
 Fig. 12.—*Aphis senecio* new species. Antennal segments III and IV, alate.
 Fig. 13.—*Cerosipha cupressi* new species. Antenna, alate.
 Fig. 14.—*Symydobius chrysolepis* new species. Antenna, alate.
 Fig. 15.—*Myzocallis davidsoni* new species. Antennal segment III, alate.
 Fig. 16.—*Symydobius chrysolepis* new species. Antennal segment III and IV, alate.
 Fig. 17.—*Myzocallis maureri* new species. Antennal segment III, alate.
 Fig. 18.—*Lachnus ferrisi* new species. Antenna, alate.
 Fig. 19.—*Lachnus ferrisi* new species. Antenna, apteran.
 Fig. 20.—*Lachnus taxifolia* new species. Antenna, alate.
 Fig. 21.—*Aphis senecio* new species. Cornicle, alate.
 Fig. 22.—*Aphis ramona* new species. Cornicle, alate.
 Fig. 23.—*Aphis ramona* new species. Cauda, alate.
 Fig. 24.—*Aphis senecio* new species. Cauda, alate.
 Fig. 25.—*Lachnus ferrisi* new species. Cornicle, alate.
 Fig. 26.—*Lachnus taxifolia* new species. Cornicle, alate (top view).
 Fig. 27.—*Lachnus taxifolia* new species. Cornicle, apteran (side view).
 Fig. 28.—*Nectarosiphon morrisoni* new species. Cauda, alate.
 Fig. 29.—*Myzocallis maureri* new species. Cornicle, alate.
 Fig. 30.—*Symydobius chrysolepis* new species. Cornicle, alate.
 Fig. 31.—*Nectarosiphon morrisoni* new species. Cornicle, alate.
 Fig. 31.—*Symydobius chrysolepis* new species. Cauda, alate.
 Fig. 33.—*Myzocallis maureri* new species. Cauda, alate.
 Fig. 34.—*Myzocallis davidsoni* new species. Cornicle, alate.
 Fig. 35.—*Myzocallis davidsoni* new species. Cauda, alate.
 Fig. 36.—*Myzocallis davidsoni* new species. Anal plate, alate.
 Fig. 37.—*Myzocallis maureri* new species. Anal plate, alate.
 Fig. 38.—*Symydobius chrysolepis* new species. Anal plate, alate.
 Fig. 39.—*Cerosipha cupressi* new species. Cauda, alate.
 Fig. 40.—*Nectarosiphon morrisoni* new species. Antennal segment III, apteran.
 Fig. 41.—*Nectarosiphon morrisoni* new species. Antennal segment III, alate.